

Science – It's Child's Play

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Dr Nazir shows his students that learning can be fun by getting them to build toys using scientific principles. Photo Credit: Academy of Singapore Teachers

Aiming to make his lessons more engaging, Dr Muhammad Nazir bin Amir, Lead Teacher (Science) at Greenview Secondary School, devised a set of teaching strategies to bring the real world into the classroom.

Drop a packet of ketchup into a bottle of water and watch it sink to the bottom. Task: find a way to make the packet float and explain why your method works.

A group of students try various ways to solve the puzzle. They tilt the packet; they even out the sauce. The teacher finally reveals that the water is the key. Just add salt and the sachet floats. It's a matter of density, a topic in the Science syllabus.

This is an example of what goes on in the classroom of Dr Muhammad Nazir bin Amir, Lead Teacher (Science) at Greenview Secondary School.

Dr Nazir aims to help his Normal (Technical) students enjoy their Science classes, boost their learning and change their attitudes about school. In fact, the opportunity to teach Normal (Technical) students is what inspired him to join the teaching profession after completing a relief stint more than 12 years ago. Even though Dr Nazir also taught Express and Normal (Academic) classes, it was the Normal (Technical) students who inspired him most.

Recalling his feelings after two months on the job back in the early 2000s, he says, “I found myself waking up in the morning looking forward to going to school every day.” Now, armed with a PhD in education, Dr Nazir is the driving force behind the development of innovative lessons designed to better engage students.

When Dr Nazir was just starting out, his colleagues told him that his lessons should be hands-on. He soon found out that even going this route didn’t always yield the desired results.

Case in point: a Physics class where students had to measure the diameter of metal balls using Vernier callipers. Instead of focusing on the task, the students were soon tossing the balls around! That’s how prone to distraction they were, he realised.

He set out to devise lessons that would both capture the interest of students and motivate them to learn. He called it the RAP approach – “relevant, appealing and personal” – where lessons relate to the real world and students’ own experiences, with the promise of a surprise thrown in to keep them on task.

The inspiration for RAP came during a story-telling session with young children. Dr Nazir saw that the kids were distracted and he wondered what could be done to better engage them. He came up with a plan: to provide them with toys suited to the children’s stories they were hearing.

Dr Nazir challenged the students in his Design & Technology (D&T) class to build toys using the basic scientific principles they’d learned along with their creativity and problem-solving skills. The students came up with several models geared towards stories such as Rapunzel and The Tortoise and the Hare, making use of pulleys and magnets. His students had fun designing the toys and their learning was based on real-life application – attending classes was no longer a chore.

The project was such a hit that the school introduced similar hands-on Science and D&T lessons for all lower secondary N(T) students. The RAP strategy has also become multi-disciplinary in nature. Dr Nazir’s fellow teachers now use the same approach in Maths, English, PE and Art. For example, in Maths, students build kites as a means of learning the properties of angles.

Dr Nazir has succeeded in convincing his students that learning can be fun and interesting. At the same time, in the course of creating their toys, his students have inspired him with their creativity and ability to apply scientific principles.

“I want to debunk the myth that N(T) students can’t do well in their academic studies,” he says. He shows the toys to his students’ parents, who are often surprised at their kids’ achievements but also extremely proud.

Dr Nazir also enters his students’ work in Science competitions. He was overjoyed when a group of his charges won the Raffles Junior College Toy Inventors’ Challenge in 2005. Students from other schools even approached the members of his class to offer their congratulations and try out their creations.

Seeing his students gain confidence from such experiences is all the motivation Dr Nazir needs to keep pursuing his passion – imparting scientific knowledge and inspiring young minds.